

REMARKS

Reconsideration of the above-identified application, in view of the above amendments above and below remarks following, is respectfully requested.

Applicants and their attorneys wish to thank Examiner DiVerdi and Wood for a most helpful and courteous interview on May 15, 2001.

Claims 1, 4-10 13-20 and 23-39 are before the Examiner.

In this Response, Claims 1, 4, 10, 14, 20, 28, 30, 31, 33, 34 and 36 have been amended. Claims 40-120 have been cancelled in view of the restriction requirement with Applicants reserving the right to file a Divisional application.

Applicants' invention is directed to the use of metal carboxylate salts that unexpectedly eliminates or substantially eliminates reactor fouling without the elimination of static in the reactor. Another way of reciting the unexpected results is, operability of the polymerization process is maintained in the presence of reactor static. What is also greatly unexpected in accordance with the invention is that polymer properties such as MW and catalytic activity are virtually unaffected when employing the catalyst system and metal carboxylate salts of the invention. The lack of affect on the polymer properties and catalytic activity is unequivocally demonstrated in Table 2, 3, 6 and 7 of the application. The absence of any change in polymer properties and catalytic activity is extremely strong evidence that the catalyst system (the metallocene-type compound and/or the activator such as alumoxane) do not form a reaction product with the metal carboxylate salt. A reaction between the salt and the catalyst system components, as one of ordinary skill in the art would understand, alter the polymerization properties of the catalyst system.

Claims 1, 4-10, 13-20 and 23-39 have been rejected under 35 U.S.C § 112, second paragraph. The Examiner objects to the word "type" as rendering the claim unascertainable. This rejection is respectfully traversed.

It is submitted that the word "type" is thoroughly defined and explained on pages 10 through 18 and particularly page 10 such that the ordinary practitioner in the art would understand the scope of the invention. However, to facilitate prosecution of this application, applicants have amended claims 1, 10 20, 28, 30, 31, 33, 34 and 36 to remove the term "-type".

Claims 1, 9, 10, 20 and 25 have been rejected under 35 U.S.C. 102(e) as being anticipated by Masi et al. This rejection is respectfully traversed.

In the background of the invention (Col.1 carried over to Col. 3, line 11) of Masi et al. the Patentee describes the problems associated with polymerizing styrene to syndiotactic polystyrene. In order to obtain a catalyst system having high productivity and high conversion, high average MW while at the same time maintaining control of the stereoregularity of polymer product Patentee modifies the polymerization catalyst (At Col. 3, line 13 it is called a "Particular catalyst system").

In all of Patentees' Examples, one or more of the catalyst components are contacted with the acetic acid. In Examples 1- 3 the "metallocene" is reacted to form acetate. Examples 4-12 demonstrate the polymerization using the catalyst. In Example 14 the alumoxane is reacted with acetic acid to form acetate and polymerization is demonstrated. The entire tenor of the patent demonstrates that the modifier as employed affects the catalytic properties of the catalyst system.

In Applicants' application it is clearly shown in the Examples that the carboxylate, although contacted with the catalyst, the carboxylate is homogeneously dispersed throughout the catalyst particles. The carboxylate is free to prevent fouling while not affecting polymer product properties and catalytic productivity.

It is the lack of reaction that differentiates applicants' invention from Patentees'. Withdrawal of the rejection is respectfully asked.

Claims 4-8, 13-19, 23, 24 and 26-39 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Masi et al. The Examiner suggests that $MQ_x(OOCR)_y$, a catalyst carrier, and activator with Cp^*TiCl_3 and MAO-acetate, and certain weight percentages would be obvious. This rejection is respectfully traversed.

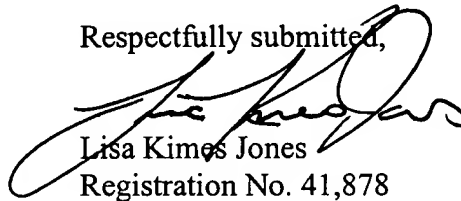
It is submitted that the rejection under 103 fails for reason as recited in the response to the 102(e) rejection. Additionally, nothing in Masi et al. would suggest, for example, that the use of the stearate compounds would result in a polymerization process manifesting substantially no fouling. It is submitted that the absence of fouling constitutes unexpected results that removes any possible prima facie case of obviousness. It is also respectfully submitted that Masi et al. teaching of the MAO oligomer does not

make obvious Applicants' claim 4 formula. It is submitted that even if MAO formula did make Applicants' Claim 4 formula obvious, that and the disclosure of R-COO-G would not make obvious the unexpected results of the absence of fouling.

It may be true that for one of ordinary skill in the art, it would have been obvious to determine optimal ranges and general operating conditions. Nevertheless, working within the disclosure of Masi et al., all one of ordinary skill in the art would expect is to possibly improve on the syndiotactic polymer and the polymerization activity. It is respectfully submitted that there would be no way for one of ordinary skill in the art to predict applicants' unexpected results by merely manipulating ranges and general operating conditions.

In light of the above, Applicants respectfully submit that this application is now in condition for allowance. Should the Examiner have any questions or require any additional information, he is invited to contact the undersigned.

Respectfully submitted,



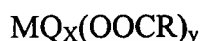
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Twice Amended) A catalyst composition [comprising, in combination, a polymerization catalyst] comprising a bulky ligand metallocene[-type] catalyst compound, an activator contacted, and a carboxylate metal salt wherein the carboxylate metal salt does not react with the bulky ligand metallocene-type catalyst compound or activator.

4. (Once Amended) The catalyst composition of a claim 1 wherein the carboxylate metal salt is represented by the formula:

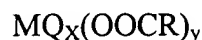


where M is a metal from the Periodic Table of Elements; Q is halogen, or a hydroxy, alkyl, alkoxy, aryloxy, siloxy, silane or sulfonate group; R is a hydrocarbyl radical having from [2] 4 to 100 carbon atoms; x is an integer from 0 to 3; y is an integer from 1 to 4; and the sum of x and y is equal to the valence of the metal M.

10. (Twice Amended) A method of making a catalyst composition, the method comprising the steps of combining:

- (c) a polymerization catalyst comprising a bulky ligand metallocene[-type] catalyst compound; and
- (d) a carboxylate metal salt, wherein the carboxylate metal salt and catalyst composition do not form a reaction product.

14. (Once Amended) The catalyst composition of a claim 10 wherein the carboxylate metal salt is represented by the formula:



where M is a metal from the Periodic Table of Elements; Q is halogen, or a hydroxy, alkyl, alkoxy, aryloxy, siloxy, silane or sulfonate group; R is a hydrocarbyl radical having from [2] 4 to 100 carbon atoms; x is an integer from 0 to 3; y is an integer from 1 to 4; and the sum of x and y is equal to the valence of the metal M.

20. (Twice Amended) A method of making a catalyst composition, the method comprising the steps of:

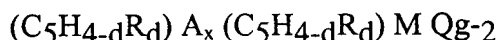
- (c) forming a polymerization catalyst comprising a bulky ligand metallocene[-type] catalyst and an activator; and
- (d) adding at least one carboxylate metal salt which is unreactive with the catalyst composition.

28. (Once Amended) The method of claim 20 wherein the polymerization catalyst formed is a supported bulky ligand metallocene[-type] catalyst system that is substantially dry and free flowing, and the at least one carboxylate metal salt is contacted with the supported bulky ligand metallocene[-type] catalyst system.

30. (Once Amended) A method of making a catalyst composition, the method comprising the step of mixing a preformed, solid free flowing supported bulky ligand metallocene[-type] catalyst system with a carboxylate metal salt wherein the carboxylate metal salt is unreactive with the catalyst system.

31. (Once Amended) The method of claim 30 wherein the weight percent of the carboxylate metal salt based on the total weight of the supported bulky ligand metallocene[-type] catalyst system is in the range of from about 0.5 to about 25 weight percent.

33. (Once Amended) The method of claim 30 wherein the supported bulky ligand metallocene[-type] catalyst system comprises a bulky ligand metallocene[-type] catalyst compound represented by the formula:



wherein M is a Group 4, 5, 6 transition metal, $(C_5H_4-dR_d)$ is an unsubstituted or substituted cyclopentadienyl derived bulky ligand bonded to M, each R, which can be the

same or different, is hydrogen or a substituent group containing up to 50 non-hydrogen atoms or substituted or unsubstituted hydrocarbyl having from 1 to 30 carbon atoms or combinations thereof, or two or more carbon atoms are joined together to form a part of a substituted or unsubstituted ring or ring system having 4 to 30 carbon atoms, A is one or more of, or a combination of carbon, germanium, silicon, tin, phosphorous or nitrogen atom containing radical bridging two ($C_5H_4-dR_d$) rings; each Q which can be the same or different is a hydride, substituted or unsubstituted, linear, cyclic or branched, hydrocarbyl having from 1 to 30 carbon atoms, halogen, alkoxides, aryloxides, amides, phosphides, or any other univalent anionic ligand or combination thereof; also, two Q's together may form an alkylidene ligand or cyclometallated hydrocarbyl ligand or other divalent anionic chelating ligand, where g is an integer corresponding to the formal oxidation state of M, and d is an integer selected from the 0, 1, 2, 3 or 4 and denoting the degree of substitution and x is an integer from 0 to 1.

34. (Amended) The method of claim 33 wherein x is 1 and the weight percent of the carboxylate metal salt based on the total weight percent of supported bulky ligand metallocene[-type] catalyst system is in the range of from about 0.5 to about 25 weight percent.

36. (Once Amended) The method of claim 30 wherein the mixing period of time is from about 1 minute to about 12 hours and the supported bulky ligand metallocene[-type] catalyst system is supported on an inorganic oxide.